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          A methodology and concomitant system for the reconstruction of an object from measurements of the transmitted intensity of scattered radiation effected by irradiating the object with a source of radiation. The measurements of the transmitted intensity are both spatially sampled and limited. The transmitted intensity is related to either the absorption coefficient or diffusion coefficient, or both, of the object by an integral operator. The image is directly reconstructed by executing a prescribed mathematical algorithm, as determined with reference to the integral operator, on the transmitted intensity of the scattered radiation. In a preferred embodiment, the data is measured using a paraxial arrangement composed on a single source and a small number of on-axis and off-axis detectors with the arrangement being moved over the measurement surface to measure the set of sampled and limited data.

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